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Remedial Action Plan for Fort Douglas

Fort Douglas
Environmental Investigation/Alternatives Analysis

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Remedial Action Plan

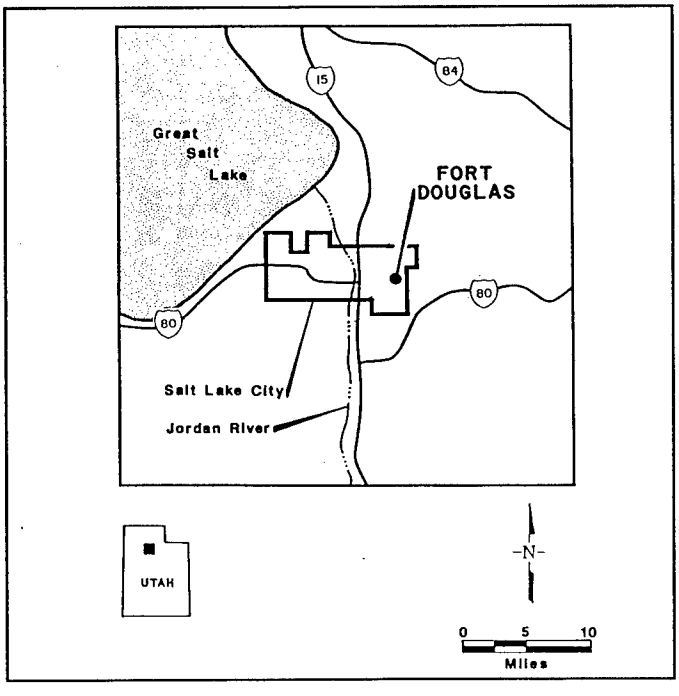
Fort Douglas Excessed Areas

Salt Lake City, Utah

MARCH 1994

ARMY ANNOUNCES REMEDIAL ACTION PLAN

This Remedial Action Plan (RAP), issued by the U.S. Army (Army), identifies the preferred alternatives for cleaning up electrical utility transformers and residential structures containing lead-based paint at Fort Douglas. These contaminated areas are within areas of Fort Douglas that have been transferred to the University of Utah. This transferred property is known as the excessed area. This document explains the rationale for choosing the preferred alternatives and summarizes other alternatives. The Army will select a final remedy for the site only after the information submitted during the public comment period has been reviewed and considered.



The RAP is consistent with the public participation responsibilities delineated under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund, and the National Environmental Policy Act of 1969. The RAP summarizes the results of an Environmental Investigation (EI) of the site, and a remedial Alternatives Analysis (AA), both of which have generally followed guidance established in CERCLA. The purpose of the EI was to identify potential environmental problems associated with the transfer of the excessed area. It involved the collection, testing, and assessment of potentially-contaminated materials in the excessed area of Fort Douglas, and an assessment of risk to human health. The purpose of the AA was to assess remedial alternatives for environmental concerns identified in the EI. The AA included the identification and detailed evaluation of potential remedial alternatives. The RAP is intended to encourage public comments on all of the cleanup alternatives.

The public is urged to review the EI/AA documents to gain a more comprehensive understanding of the site. The site documents, which contain the information upon which the selection of response actions will be based, are available at the following locations:

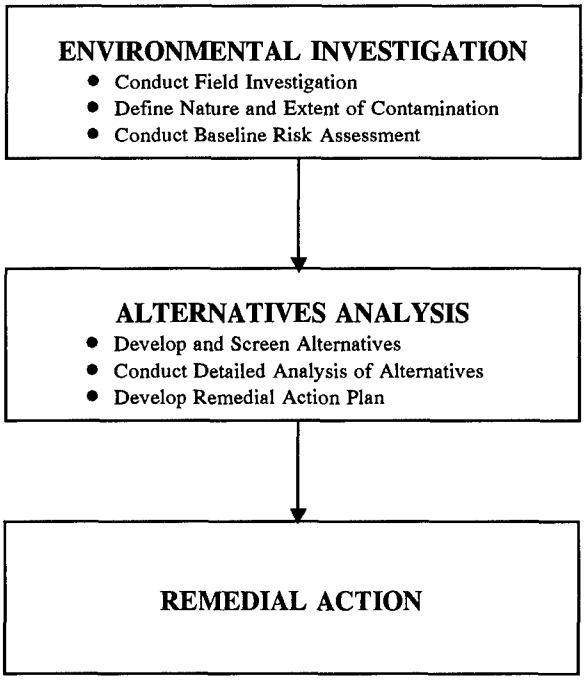
Special Collections
University of Utah
Marriott Library
Salt Lake City, UT 84112

and

Main Library
209 East 5th South
Salt Lake City, UT 84111

Please note that a glossary and explanations of the evaluation criteria appear near the end of this document.

EI/AA PROCESS



Dates to remember:
MARK YOUR CALENDAR

May 9, 1994 - June 10, 1994
Public comment period on remedial actions at Fort Douglas.

The Army may modify the preferred alternative or select another response action presented in this plan and the AA report based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

SITE BACKGROUND
A BRIEF HISTORY OF FORT DOUGLAS

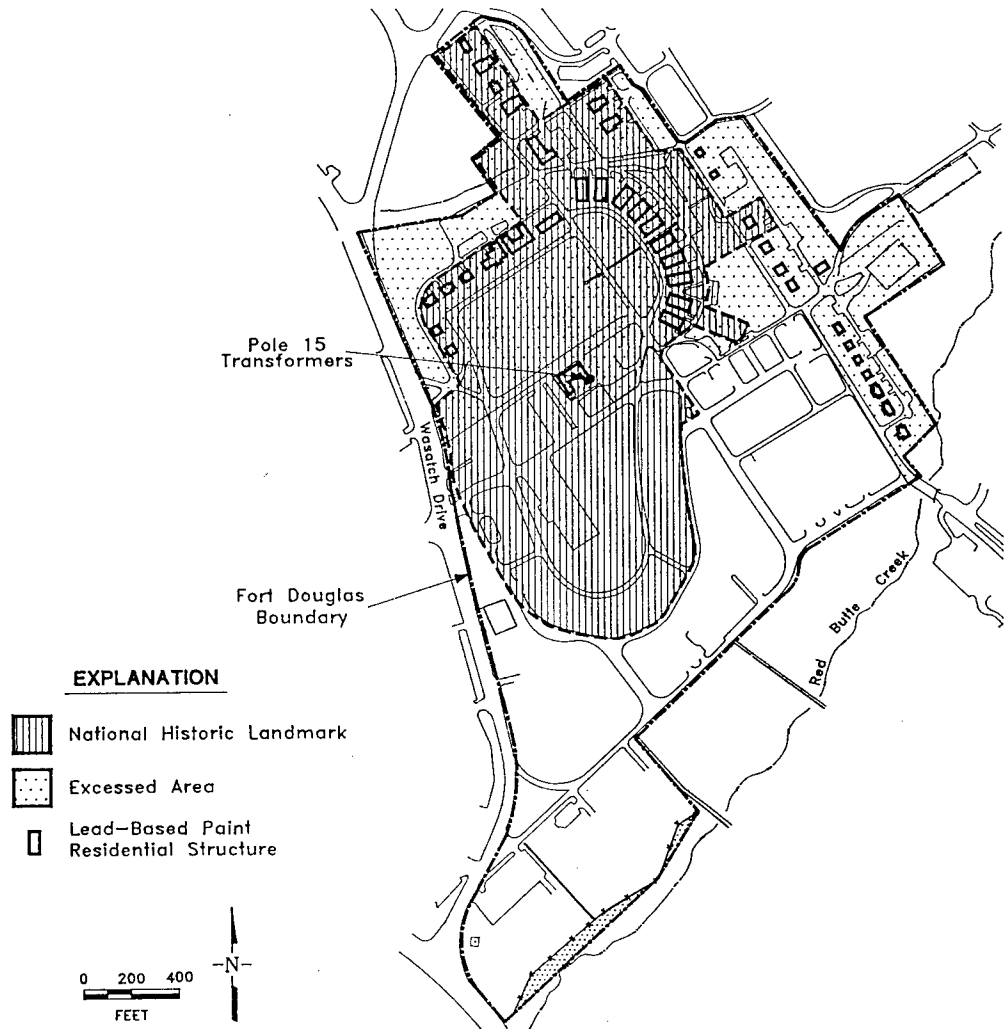
Fort Douglas was established on October 26, 1862 to guard the Overland Mail route and protect the lines of communication that linked the East and West Coasts. In the first half of the 20th Century, Fort Douglas was used to garrison troops, house prisoners of war, and serve as headquarters for military units. Since 1948, Fort Douglas has been used as headquarters for Reserve and National Guard units and a support detachment for military activities in the region. No major industrial activities have been conducted at Fort Douglas. Only light industrial operations associated primarily with the maintenance and repair of base facilities and vehicles have been conducted.

Fifty-one acres of the 119-acre facility were conveyed to the University of Utah on November 5, 1991, as recommended by the Defense Secretary's Commission on Base Realignment and Closure. The excessed property consists predominantly of housing units, constructed primarily between 1863 and 1942. Forty of the 69 structures within the excessed area are within the National Historic Landmark, and most of them are included in the National Register of Historical Places.

SUMMARY OF SITE RISKS

The first portion of the EI program was designed to locate and identify contamination in the excessed area of Fort Douglas. This involved a field investigation of buildings, pole-mounted transformers, and soils. Samples of these media were collected and chemically analyzed at commercial analytical laboratories. The locations of the samples and the concentrations of contaminants, if detected, were used to characterize the nature and extent of contamination in these media. The

FORT DOUGLAS EXCESSED AREA SITES



contaminants that were detected include polychlorinated biphenyls (PCBs) in two pole-mounted transformers, lead-based paint on interior and exterior building surfaces, and petroleum hydrocarbons and lead in soils at two locations.

The next step in the EI was designed to determine if the contamination detected should be cleaned up. Cleanup is warranted if the contamination poses a risk to human health or the environment. Risk to human health is typically determined using a scientific process known as risk assessment. A risk assessment first identifies the pathways by which contaminants could conceivably affect humans in the area. These pathways can include ingestion (eating or drinking), inhalation (breathing vapors or dust), and skin contact. After the potential pathways are identified, the amount of contamination that could be conveyed through these pathways is calculated. This calculation is based on the level of contamination at the site and the length of time that a person could be exposed. Finally, the toxicity of the contaminant(s) is considered. If the amount of contamination, the pathway(s) of exposure, the duration of exposure, and the toxicity would cause a risk to human health, then cleanup is warranted.

In certain cases, the determination to clean up a site may be made without conducting a risk assessment. This can occur if regulatory requirements or guidelines specifically indicate that a cleanup is warranted, or if there are other circumstances to consider. At Fort Douglas, the lead-based paint on building exterior and interior surfaces, and the two PCB-containing

transformers fall into this category. The methods to clean up these media are discussed later in this plan.

In the case of the petroleum hydrocarbon-contaminated soils, a risk assessment was conducted to determine if soil cleanup is warranted. The concentrations of petroleum hydrocarbons in the soil were determined using two chemical analysis methods. The first method reported the total amount of petroleum hydrocarbons (TPH). The second method reported a subset of the TPH that are known to cause cancer in laboratory animals, and are thus classified as possible human carcinogens. This subset consists of chemicals referred to as polycyclic aromatic hydrocarbons (PAHs). PAHs are also known to cause adverse, noncancerous health effects in humans. As such, the PAHs typically drive risk assessments that are based on petroleum hydrocarbon contamination. The risk assessment conducted on the excessed area soils shows that the levels of PAHs detected do not exceed regulatory requirements. Benzene, toluene, ethylbenzene, and xylene (BTEX)—known carcinogenic components of TPH—were not detected in the soil. The remainder of the hydrocarbons detected by the TPH analysis are not known to be of concern to human health or the environment.

The risk of noncancerous health effects caused by PAHs in the soil was also evaluated in the risk assessment. This risk was determined by calculating a ratio that compares the level of exposure known to cause adverse health effects in the most sensitive people, to the level of exposure to which people could be subjected at the site. This ratio is known as a Hazard Quotient. The estimated Hazard Quotient was well below regulatory limits.

Lead was also detected in soils in the excessed area of Fort Douglas. The concentrations, however, were well below U.S. Environmental Protection Agency (USEPA) health guidelines for soils. Since no risk to human health is reflected by the risk assessment for petroleum hydrocarbons, and the lead concentrations are below regulatory health limits, no cleanup actions are proposed for soils in the excessed areas.

SCOPE AND ROLE OF ACTION

Two remedial action sites were selected in the AA:

- Two pole-mounted electrical utility transformers that contain PCBs.
- Residential buildings with lead-based paint.

The transformers were selected as a remedial action site to be protective of human health and the environment, based on the possibility of future leakage of the PCBs from the transformers. The federal laws pertaining to PCB-contaminated transformers do not require the transformers to be taken out of service; however, their disposal is regulated. Two PCB-contaminated transformers are located on pole 15. The cleanup objectives are to comply with all ARARs and prevent the possibility of transformer oil reaching the ground in the future. These objectives would be achieved by removal, disposal, and replacement of the PCB-containing transformers.

The residential buildings containing lead-based paint were selected as a remedial action site based on federal laws. Lead-based paint is present in all of the residential structures (40 buildings) within the excessed area. For the purpose of this plan, a residential building includes any structure that has been used historically or recently for housing. The cleanup objectives are to comply with all ARARs and be protective of human health and the environment during remediation activities. These objectives would be achieved by a combination of the various techniques that are used for lead-based paint abatement.

Soils were not selected as a site because the results of the risk assessment indicated the chemicals detected in the soil do not pose a risk to human health or the environment, and there are no federal or state laws requiring their cleanup. Therefore, no remedial alternatives were developed for the soils.

SUMMARY OF ALTERNATIVES

The remedial alternatives considered for the cleanup of PCBs in transformers and lead-based paint in residential buildings are numbered below to correspond to the numbers in the AA report. The alternatives for the PCB transformer cleanup are:

- Alternative 1: No Action
- Alternative 2: Removal, Disposal, and Replacement

The alternatives for the lead-based paint cleanup are:

- Alternative 1: No Action
- Alternative 2: Lead-Based Paint Abatement

TRANSFORMERS:
The remedial actions for the PCB-contaminated transformer oil were based on the Toxic Substances Control Act (TSCA), regulated by 40 CFR § 761, Subparts A through G. TSCA regulations must be followed for disposal of PCBs and PCB-contaminated items. Under TSCA, PCB-contaminated transformers are not required to be removed from service; however, when the transformers are removed from service and disposed of, TSCA regulations must be followed. The PCB-contaminated transformers are still in service and are not a health risk to humans. Each PCB-contaminated transformer consists of approximately 200 pounds of casing and 50 gallons of oil. However, the transformers were observed to be in poor condition and a remedial action alternative was developed to ensure that no contaminated oil will reach the ground in the future.

Alternative 1: NO ACTION

Capital Cost*: $0
Annual O&M Costs*: $0
Present Worth*: $0
Months to Implement*: None

The "no action" alternative is evaluated at every site to establish a baseline for comparison against the other alternatives. This alternative would not involve containment, removal, or treatment of the two PCB-contaminated transformers on pole 15. The site would be left in its current condition.

Alternative 2: REMOVAL, DISPOSAL, AND REPLACEMENT

Capital Cost*: $5,900
Annual O&M Costs*: $0
Present Worth*: $5,900
Months to Implement*: 2

This alternative involves the removal, detoxification, and recycling of the PCB-contaminated oil, transformer disposal (by smelting), and replacement. The transformers and oil would be disposed of in accordance with TSCA regulations in 40 CFR § 761. This alternative would be subject to all other ARARs for PCB-contaminated materials.

LEAD-BASED PAINT BUILDINGS:
The remedial actions for the defective lead-based paint surfaces are based on the Lead-Based Paint Poisoning Prevention Act regulated by 24 CFR § 35, Subpart E. The requirements established by this regulation are applicable to all federally-owned properties to be sold for residential habitation. All structures within the excessed areas that have been used historically or recently for housing are considered to be regulated by the Lead-Based Paint Poisoning Prevention Act. As stated in the act, defective interior and exterior paint surfaces are assumed to be immediate hazards and must be remediated to eliminate the hazards. Remediation would involve a combination of lead-based paint abatement techniques including containment (enclosure/encapsulation), physical/chemical treatment (physical removal of paint by scraping or chemical stripping), and removal/replacement (of lead-contaminated objects). Approximately 40 residential structures have lead-based paint on exterior surfaces; a total of 65 housing units have lead-based paint on interior surfaces. A housing unit may be defined as a separate residential dwelling unit that is occupied or intended to be used as the home or residence of one or more persons. For example, a duplex house is a single structure, yet contains two housing units.

Alternative 1: NO ACTION

Capital Cost*: $0
Annual O&M Costs*: $0
Present Worth*: $0
Months to Implement*: None

The "no action" alternative is evaluated at every site to establish a baseline for comparison against the other alternatives. This alternative would not involve containment, physical or chemical removal of lead-based paint, or removal/replacement of objects with defective paint surfaces. The buildings would be left in their current condition.

Alternative 2: LEAD-BASED PAINT ABATEMENT

Capital Cost*: $1,625,000
Annual O&M Costs*: $0
Present Worth*: $1,625,000
Months to Implement*: 8

This alternative involves a combination of lead-based paint abatement techniques. The abatement technique used for each defective paint situation will vary depending on the conditions and extent of defective paint. The defective lead-based paint would be

* All costs and implementation times are estimated.

remediated in accordance with the Lead-Based Paint Poisoning Prevention Act regulations in 24 CFR § 35. This alternative would also have to comply with all other ARARs concerning lead-based paint and historical properties.

EVALUATION OF ALTERNATIVES

The preferred alternative for the PCB-contaminated transformers is Alternative 2 — Removal, Disposal, and Replacement. The preferred alternative for lead-based paint buildings is Alternative 2 — Lead-Based Paint Abatement. Based on current information, these alternatives would appear to provide the best balance based on the nine evaluation criteria. These criteria are: overall protection; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost; state acceptance; and community acceptance. In addition to the nine criteria, other site-specific considerations may apply. This section profiles the performance of the preferred alternative against the nine criteria, noting how it compares to the other options under consideration.

ANALYSIS

Overall Protection

Transformers: This criterion is satisfied by both alternatives. There is no risk to human health, because there is no existing exposure pathway; the contaminated fluids are enclosed by the transformers, which are generally isolated from human contact.

Lead-Based Paint Buildings: Alternative 1 does not eliminate the immediate hazard associated with defective paint surfaces. Intact lead-based paint surfaces are not a hazard to human health as defined in 24 CFR § 35. Alternative 2 would be protective of human health by eliminating the immediate hazard of defective paint surfaces. However, safe abatement practices must be followed, otherwise this alternative could release harmful amounts of lead particles.

Compliance with ARARs

Transformers: Both alternatives comply with TSCA regulations as stated in 40 CFR § 761. Under TSCA regulations, remediation of the PCB-contaminated transformers and fluids is not required unless the transformers are scheduled to be removed from service.

EXPLANATIONS OF EVALUATION CRITERIA

- **Overall protection** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment engineering controls or institutional controls.
- **Compliance with ARARs** addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provide grounds for invoking a waiver.
- **Long-term effectiveness and permanence** refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
- **Reduction of toxicity, mobility, or volume through treatment** is the anticipated performance of the treatment technologies that may be employed in a remedy.
- **Short-term effectiveness** refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.
- **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
- **Cost** includes capital and operation and maintenance costs.
- **State acceptance** indicates whether, based on its review of the AA and Remedial Action Plan, the state concurs with, opposes, or has no comment on the preferred alternative.
- **Community acceptance** will be assessed following a review of the public comments received on the AA report and the Remedial Action Plan.

Lead-Based Paint Buildings: Alternative 1 does not comply with the Lead-Based Paint Poisoning Prevention Act as stated in 24 CFR § 35, because the alternative does not remediate defective paint surfaces. Alternative 2 does comply with 24 CFR § 35, but this remedial action also has to comply with the National Historic Preservation Act (16 USC 470; 36 CFR § 60.4), Protection of Historic and Cultural Properties (36 CFR § 800; Executive Order 11593), Historical Preservation Act (Utah Code Ann. §§ 63-18a-1 through 6), State Antiquities Statutes (Utah Code Ann. §§ 63-18-18 through 38), Resource Conservation and Recovery Act (42 USC 6901; 40 CFR §§ 261 through 264, 268), and other ARARs.

Long-Term Effectiveness and Permanence

Transformers: The target remediation levels would be achieved in the long term by Alternative 1 if the transformers remained in service. There is no risk to human health, because the PCB-contaminated fluids are inside the transformers. Alternative 1 may not be effective if the transformers are taken out of service and not properly disposed of, or if the fluid reaches the ground. Alternative 2 achieves long-term effectiveness and permanence by the complete removal of the contaminant.

Lead-Based Paint Buildings: Since no remedial actions are associated with Alternative 1, this alternative has no long-term effectiveness or permanence with regard to human health and the environment. The extent and hazard of defective paint surfaces could actually increase due to a lack of maintenance; deterioration of paint surfaces might lead to the generation of lead-contaminated dust which is hazardous to human health. Alternative 2 would be adequate and reliable in managing the hazards associated with lead-based paint. The long-term effectiveness and permanence will vary depending on the abatement technique used. Alternative 2 is very effective in the long term when the lead-based paint is permanently removed from the site; however, containment only defers the hazard — the lead-based paint remains on site. Long-term effectiveness and permanence would be enhanced by implementation of an inspection and maintenance program, and restriction of activities that could disturb the seal and/or paint surface.

Reduction of Toxicity, Mobility, or Volume

Transformers: Under Alternative 1, no reduction of toxicity, mobility, or volume would be achieved. It is unlikely that natural mechanisms would reduce toxicity or volume of the contaminants over time. The PCB-contaminated fluid is not mobile because it is inside the transformer casings; however, the transformer casings were observed to be in poor condition — eventually, the oil may reach the ground. The recycling and decontamination of the fluid and destruction of the transformer in Alternative 2 would completely eliminate the toxicity, mobility, and volume of the contaminant at the site.

Lead-Based Paint Buildings: Under Alternative 1, there would not be any reduction of toxicity, mobility, or volume of lead. Also, natural mechanisms probably would not reduce toxicity or volume over time. Alternative 2 would simply move the lead-based paint (using both removal/replacement and physical/chemical methods) from the current site to another area off site; thus, the hazard would not be eliminated, but relocated. If a physical/chemical treatment that disturbs the paint surface was used, the mobility of lead could increase if careful measures were not taken. Under Alternative 2, enclosure/encapsulation would reduce the mobility of lead at the site, but would not reduce the toxicity or volume.

Short-Term Effectiveness

Transformers: Both alternatives are effective in the short term, because human health is protected by the inaccessibility of the PCB-contaminated fluid. The remedial action objectives are met without having to implement either alternative. Alternative 2 involves removing, replacing, and disposing of the transformers and fluids, and could be completed in a minimal amount of time.

Lead-Based Paint Buildings: Alternative 1 is not effective in the short term, because it does not treat the defective paint hazard. Alternative 2 would be effective in the short term only if safe abatement practices are used to eliminate the potential release of hazardous lead dust during remediation. Effectiveness could be increased by evacuation of tenants, and adequate worker protection and training.

Implementability

Transformers: From an administrative and technical standpoint, both alternatives are readily implementable. Implementation of Alternative 2 does not require special techniques, materials, permits, or labor. The equipment and the skills needed for this operation would be readily available near the site. Acquisition of the necessary transportation and disposal permits are administrative issues that may affect implementability.

Lead-Based Paint Buildings: Alternative 1 is readily implementable, since there would be no administrative or technical changes associated with the site. Alternative 2 is readily implementable from a technical standpoint. Contractors familiar with lead-based paint abatement are available in the area. Administrative implementability of Alternative 2 may require transportation and disposal permits, and a review concerning historic preservation from appropriate federal and state agencies.

Cost

Transformers: The present worth of the preferred alternative (Alternative 2) for the transformers is $5,900.

Lead-Based Paint Buildings: The present worth of the preferred alternative (Alternative 2) for the lead-based paint abatement is estimated to be $1,625,000.

State Acceptance
The State reviewed the RAP, and did not have any comments concerning the preferred alternatives or other alternatives.

Community Acceptance
Prior to potential implementation of the preferred alternatives, community comments will be evaluated.

SUMMARY OF THE PREFERRED ALTERNATIVES

The State reviewed both the RAP and AA, and did not have comments concerning the preferred alternatives. Prior to potential implementation of the preferred alternatives, community comments will be evaluated. Changes to the preferred alternatives, or a change from the preferred alternative to another alternative, may be made if additional data indicate that a change would result in a more appropriate solution.

TRANSFORMERS
Alternative 2 — Removal, Disposal, and Replacement, is preferred for the transformers. This alternative would abide by TSCA regulations and comply with other ARARs. The PCB-contaminated transformers are still in service and are not a health risk to humans. However, since the transformers were observed to be in poor condition, Alternative 2 was chosen to ensure that no contaminated oil would reach the ground in the future.

LEAD-BASED PAINT BUILDINGS
Alternative 2 — Lead-Based Paint Abatement, is preferred for the defective lead-based paint surfaces. This alternative would abide by the Lead-Based Paint Poisoning Prevention Act and comply with other ARARs. It is also protective of human health and the environment by remediating the hazards associated with defective paint surfaces.

GLOSSARY

Specialized terms used elsewhere in the Remedial Action Plan are defined below.

AA — Alternatives Analysis. An evaluation of cleanup methods applicable to areas of environmental concern as identified in the EI.

abatement — A comprehensive process of eliminating exposure to lead paint and lead dust.

ARAR — Applicable or Relevant and Appropriate Requirement. The federal and state requirements that a preferred or selected remedial alternative will be expected to meet or exceed for any given site.

Baseline Risk Assessment — A study that quantifies the health risks of a site under the no action alternative, i.e., under current conditions with no remedial action taken.

CERCLA — Comprehensive Environmental Response, Compensation and Liability Act. A federal law, commonly known as Superfund, that was passed in 1980 to govern the assessment and cleanup of sites where hazardous substances have been released. Superfund Amendments and Reauthorization Act of 1986 (SARA) bolsters and affirms the provisions of CERCLA.

Commission on Base Realignment and Closure — A panel that evaluates the strategic value and costs of U.S. military facilities to provide the U.S. Secretary of Defense with information for making decisions for optimal usage and potential closure.

EI — Environmental Investigation. An assessment of potential environmental problems through the field collection, laboratory testing, and evaluation of potentially contaminated materials from specified sites.

encapsulation — A method of abatement that involves the coating and sealing of lead-based paint surfaces with durable, paint-like coatings that are specially designed to prevent exposure to lead paint or lead dust. Encapsulation may include acrylic and epoxy coatings and flexible wall coverings. Neither wallpaper nor a coat of new paint are acceptable.

enclosure — A method of abatement that consists of the resurfacing or covering of painted surfaces with durable materials, followed by sealing or caulking of the lead-free surfaces. The durable materials may include gypsum wallboard, plywood paneling, fiberglass, sheet metal, or exterior siding.

excessed area — The parcel of property that has been transferred from the U.S. Army to another government or private agency.

Hazard Quotient — The ratio of the amount of a chemical a person could be exposed to at a site over a specified period to the amount a person could be exposed to over a similar exposure period and expect no adverse health effects.

hydrocarbon — An organic compound containing only carbon and hydrogen that can be a liquid, solid, or gas.

Lead-Based Paint Poisoning Prevention Act — A federal law enacted in 1971 that was the initial effort to regulate lead-based paint. Subsequent amendments designated the U.S. Department of Housing and Urban Development (HUD) as the lead agency in the effort to eliminate the hazard of lead-based paint in housing. As amended, Subpart E of the implementing regulations addresses the elimination of lead-based paint hazards in federally-owned properties prior to sale for residential habitation.

National Environmental Policy Act — A 1969 federal law that provides specific requirements under which CERCLA can be enforced.

organic — Any chemical compound containing carbon derived from living organisms.

PAH — polycyclic aromatic hydrocarbons. Chemical compounds found in petroleum products and by-products. Some of these compounds can cause cancer.

PCB — polychlorinated biphenyl. Any of several compounds that are produced by the replacement of hydrogen atoms in biphenyl with chlorine atoms. PCBs have various industrial applications and can cause cancer.

preferred alternatives — The cleanup methods selected as the most acceptable based on the nine evaluation criteria and other considerations.

Remedial Action — A cleanup program initiated at a specific site.

residential structure — Any house, apartment, or structure intended for human habitation, including any nondwelling facility commonly used by children under 7 years of age, such as a child care center.

TPH — Total Petroleum Hydrocarbons. A cumulative measure of the various hydrocarbons detected in a sample.

TSCA — Toxic Substances Control Act. Federal legislation enacted in 1976 requiring testing of new chemicals, and evaluation of existing chemicals (other than pesticides) in new applications, for health and environmental effects. The act authorizes the USEPA to institute controls ranging from labeling requirements to bans.